A striking illustration showing this siliceous crustification at the geyser crater at Whakarewarewa, New Zealand, is given by the author. Hand specimens of the harder sinters cannot be distinguished from much of the ore at the outcrop of the Martha lode at Waihi. In places the sinters contain finely disseminated marcasite and traces of gold and silver.

NOTES.

A SHORT time ago a petition was presented to the Dean of Westminster asking permission to place in Westminster Abbey a memorial tablet commemorating the life and influence of Mr. Herbert Spencer, but though the appeal was supported by many men of science and letters it was rejected. The reason why the Dean withheld his consent to this unobtrusive memorial of a great philosopher is not clear; and the *Daily Chronicle* has recently revived interest in the movement with the object of inducing him to reconsider his decision, or, failing this, to secure some other national memorial of Spencer's work. From the opinions of a number of distinguished men published in our contemporary, it is evident that much disappointment is felt at the failure to find a place in the Abbey for a simple memorial tablet to Spencer, but there is a difference of opinion as to whether steps should be taken to establish a national memorial to him in some other form. Among the men of science who consider it would be a reproach to leave Spencer's memory unhonoured are Lord Avebury, Prof. Clifford Allbutt, Dr. Bastian, Sir Michael Foster, Mr. Francis Galton, Sir Joseph Hooker, Prof. M'Kendrick, and Prof. Poulton. There is, however, a strong feeling, expressed by Sir Norman Lockyer, that while no national memorial to Darwin exists outside Westminster Abbey, it would be undesirable to attempt to raise one to Spencer by public subscription. Lord Kelvin goes so far as to remark:—"I have never been of opinion that the philosophical writings of the late Mr. Herbert Spencer had the value or importance which has been attributed to them by many readers of high distinction. In my opinion, a national memorial would be unsuitable." Sir William Huggins also hesitates to support a general movement to provide a national memorial, though he agrees that a memorial tablet in the Abbey would appropriately commemorate Spencer's work. In the absence of this form of recognition, it would seem that the best way for admirers of the philosopher to show their appreciation of his work would be to establish a lectureship or scholarship in sociology, natural science, or principles of education, to issue, as suggested by Dr. A. R. Wallace, a cheap edition of his works, or in some other manner to further the objects to which he devoted his life. A movement with an end of this kind in view might be made of international interest, and would doubtless receive liberal support.

THE King has appointed a Royal Commission "To inquire into and report upon the practice of subjecting live animals to experiments, whether by vivisection or otherwise; and also to inquire into the law relating to that practice, and its administration; and to report whether any, and if so what, changes are desirable." The members of the commission are:—Viscount Selby (chairman), Colonel A. M. Lockwood, M.P., Sir W. S. Church, Bart., K.C.B., Sir W. J. Collins, M.P., Sir J. McFadyean, Mr. M. D. Chalmers, C.B., Mr. A. J. Ram, K.C., Dr. W. H. Gaskell, F.R.S., Mr. J. Tomkinson, M.P., and Dr. G. Wilson, with Captain C. Bigham, C.M.G. (secretary). The offices of the commission, which will not sit until toward the end of October, will be at Chapel Place, Delahay Street, S.W.

THE Engineering and Machinery Exhibition, which was opened at Olympia on Saturday by Sir Alexander Binnie, president of the Institution of Civil Engineers, is of wide scope, and contains a fine display of British machinery. Some interesting exhibits have also been sent by American and Continental firms. The most striking feature is an electric fountain and air circulator, which occupies the centre of the hall. It is the invention of Mr. James Keith. The fountain is 33 feet in height, and it is surrounded by a shell 15 feet in diameter. In the pedestal beneath are six large electric fans, and air is drawn in from the ground-level, washed, cooled, and re-circulated at the rate of 22,000 cubic feet of air per minute. The illuminations connected with the fountain are brilliantly effective. Numerous other interesting novelties are shown, and the display of machine tools is particularly good. At the luncheon following the opening ceremony, Sir William White, president of the exhibition, pointed out that the basis of the exhibition was mechanical engineering, which was maid-of-all-work to all other branches of engineering. The exhibition was no common enterprise, and the public could not fail to be impressed by the extraordinary variety of machinery applied to the needs of modern life, but also by the keen competition going on in the mechanical industries all over the world. Mr. Bennett Brough, who proposed the toast of the visitors, and Prof. Silvanus Thompson, who replied, also testified to the great value of the exhibition. Special facilities are being afforded to students to visit the exhibition, and an excellent course of popular lectures has been arranged. The exhibition will remain open for a month.

THE death is announced of Dr. H. Cohn, extraordinary professor of diseases of the eyes in the University of Breslau, distinguished by his studies in school hygiene.

THE new Japanese pharmacopœia is to be published shortly. The names of all drugs and chemicals will be given in Japanese characters only. Foreign preparations which have been patented under fancy names will be excluded.

IT is reported from Hong Kong that at 10 a.m. on Tuesday, September 18, a typhoon which sprang up there caused enormous damage to shipping and great loss of life. The storm lasted for two hours.

THE death is announced of Dr. Morache, professor of medical jurisprudence in the Bordeaux Medical Faculty; and of Prof. Leon Prunier, director of the Pharmacie centrale des Hôpitaux civils in Paris, at the age of sixty-five. Prunier's scientific work touched upon many branches of chemistry; his book "Les Medicaments chimiques" (in two volumes) was a recognised treatise in France.

THE Association des Industriels de France contre les Accidents du Travail intends offering a prize of 8000 francs for an international competition for a new galvanic battery or accumulator which, while having a large output for its size and weight, must not be dangerous in use. Inquiries should be addressed to the director of the society, rue de Lutèce, Paris, who will supply further particulars, and to whom competitors must send their descriptions and drawings.

A COMPLETE change of weather set in during the past week, and the drought which continued with such persistence during the closing week of August and the first fortnight of September was at length thoroughly broken. Rain fell on several days over the entire country, and the rainfall in the aggregate now almost equals the average for the month in many parts of England. Temperatures are again in agreement with the normal, and in the past week the exposed thermometer at Greenwich fell below the freezing point on two consecutive nights.

THE fifth biennial meeting of the International Commission for Scientific Aëronautics will be held this year at Milan, from September 30 to October 7. A programme for continuing the meteorological exploration of the atmosphere will be adopted (says *Science*), and it is expected that the president of the commission, Prof. Hergesell, will state the results of soundings of the atmosphere, which he has just executed near Spitsbergen from the Prince of Monaco's yacht, and that Messrs. Teisserenc de Bort and Rotch will give an account of the second Franco-American expedition which they sent last winter to the tropical Atlantic for a similar purpose.

WE learn from the *Times* that the arrangements for the international balloon race which is to take place on September 30 have been completed. Sixteen balloons will be employed in the race, and the aëronauts will represent Great Britain, France, Germany, America, Italy, Belgium, and Spain. The arrangements for the race have been made by the Aéro Club of France, and the start will be made from the Place de la Concorde, Paris. The moving spirit in the contest is Mr. Gordon Bennett, who offers a challenge cup, value 500*l.*, and 500*l.* in cash for the winner. The prizes will be awarded to the aëronaut who goes the furthest distance. The longest distance yet made in any of these expeditions has been 1200 miles, from Paris to Kieff, in Russia, but it is possible that under favourable conditions that record may be broken.

A CONFERENCE of members of the Museums Association and others interested in museum work will be held at Chester on Saturday afternoon, September 22, for the purpose of discussing subjects of common interest to those concerned in the work of museums, art galleries, and kindred institutions. The following papers will be read and discussed:—The nature of the archæological collections in the Grosvenor Museum, Chester, R. Newstead; the nature of the natural history collections in the Grosvenor Museum, Chester, A. Newstead; the comparative method in the exhibition of museum specimens, J. A. Clubb; museum taxidermy, and the status of the taxidermist, J. W. Cutmore.

THE Hull Municipal Museum recently purchased the extensive geological collection formed by the late Mr. George Lether, of Scarborough. Mr. Lether was well known as an enthusiastic collector, and for many years he was engaged in making a collection of the smaller species to be found in the fossiliferous deposits which are so well represented around Scarborough. The Kelloways Rock, Calcareous Grit, Coral Rag, Cornbrash, the Millepore limestone and Scarborough limestone were well known to him, and from these various strata he obtained the collection now at Hull. It is particularly strong in the smaller gasteropods, but in addition contains a fine series of sea-urchins, terebratulæ, ammonites, corals, &c. The collection is one of exceptional value, and is a welcome addition to the local geological collection in the Hull Museum.

REPORTS of disturbances in the earth's crust continue to be received. During the past few days the following shocks of a severe character have been felt:—*September* 12, Santiago de Chile. Between 1.20 a.m. and 5 p.m. numerous earthquake shocks were felt in the region situated between the provinces of Santiago and Maule. The shocks are attributed to the Chillan volcano, which is in full activity. Near the mouth of the Bio-Bio River an upheaval has been produced, leaving part of the bed of the river dry. *September* 13, Sicily.—At 10.43 a.m. a slight shock of earthquake was felt at Palermo, and was succeeded by other shocks later. The inhabitants at Termini and in the neighbouring district are in an indescribable state of panic. All the houses in Trabia are cracked, and many have collapsed. Slight shocks were felt at Rioja, Chilecito, and Santiago del Estero. A more violent shock occurred at Tinogasta, followed by loud rumbling. *September* 17, Shemakha, Transcaucasia.—An earthquake, lasting ten seconds, was felt at 3 p.m. The disturbance appeared to move in a direction from north-west to south-east.

THE subject of malaria in Greece was dealt with by Prof. Ronald Ross, F.R.S., on Monday, in the course of an address at a luncheon given at Liverpool to Prof. Savas, of the University of Athens. Prof. Ross said that at the request of the Lake Copias Company (Limited) the Liverpool School of Tropical Medicine had made an investigation as to the prevalence of malaria in Greece. He went out to that country last May, and found a very serious state of affairs. The population was practically confined to the valleys, the mountains being almost uninhabitable, and in these valleys he found a good deal of malaria. The statistics of the whole country showed that out of a population of, roughly, 2½ millions, there were 250,000 cases of malaria every year, and the deaths were about 1760. Last year the number of cases increased to 960,000, and the deaths to 5916. He was of opinion that it was malaria which checked the life of ancient Greece, and that the disease was introduced, or at all events reinforced, at the time that Greece brought natives of Asia into the country. The movement initiated by Dr. Savas to deal with the plague was one which should recommend itself to all interested in the progress of civilisation.

A DETAILED description is given in the *Engineer* (vol. cii., No. 2644) of some interesting models of rock-drilling and boring machinery that have been added to the cases devoted to this branch of mechanics at the Victoria and Albert Museum.

AN interesting incident of a sparrow caught in a spider's web is reported to the *Spectator* of September 8 by Mr. B. G. Tours, writing from the British Consulate in Chinkiang, China. The web was built across a brick arch, and the sparrow, a full-grown bird, flying through it head downwards became caught in it. All its efforts to release itself only served to add to its discomfort, and the bird soon became exhausted and gave up struggling. Mr. Tours then released it, and he adds that it was "looking and evidently being very uncomfortable in his extra clothes of cobweb." During the whole proceeding the very large spider had not attempted to interfere with the bird, and would probably have waited until it was dead before doing so.

IN *Engineering* of September 14 there is a long description, and a large number of excellent illustrations, of the quadruple-screw steam-turbine-driven 25-knot Cunard liner *Mauretania*, to be launched on September 20 from the Wallsend shipyard. The following are the dimensions of the vessel:—length over all, 785 feet; length between perpendiculars, 760 feet; beam, extreme, 88 feet; depth, moulded, 60 feet 6 inches; gross tonnage, 33,200 tons; net tonnage, 11,900 tons; maximum draught, 37 feet; displacement at this draught, 43,000 tons. The *Mauretania* is 160 feet longer than the *Campania*, of 1893, 78 feet 6 inches longer than the fastest of existing ships—the *Kaiser Wilhelm II.*—and 80 feet longer than the *Great Eastern*, the greatest of preceding vessels.

IN Cornwall at the present time, owing to the high price of metals, there is great activity in copper and tin mining, and it is interesting to note, in an important article in the *Times* of September 17, the extent to which scientific methods and the latest improvements in appliances are being adopted at the newly started mines. At the Tywarnhaile mine, for example, with the aid of a gas-power plant and electric pumps, the workings have been drained at the rate of 1400 gallons a minute. This speed has never been approached in the past history of Cornish mines. At the Great Dowgas tin mines, pneumatic stamps will for the first time be driven direct by gas power, and winding and pumping will be electrical. At the Alfred mines a central gas-power plant has also been installed. When work was resumed at the Clitters mine some five years ago, those responsible formed the opinion that the costs of working mines in Cornwall were far too high; that values existed in mixed ores far beyond the knowledge of those then concerned in mining and dressing such ores; and that great improvements in mining and dressing methods were possible. It has been proved that these impressions were true, and future developments in the application of modern scientific methods to the ancient Cornish mines cannot fail to be watched with interest.

THE seventeenth annual general meeting of the Institution of Mining Engineers, held at Hanley on September 12–14 under the presidency of Sir Lees Knowles, was very largely attended, and an interesting programme of visits and excursions was arranged. The report of the council showed that the membership of the institution now amounts to 3034. Mr. Maurice Deacon (Chesterfield) was elected president for the ensuing year. Three papers were read. Mr. W. D. Verschoyle described a new pocket transit, which was really a combined prismatic compass and clinometer, ingeniously arranged for observing very steep angles. Mr. T. Trafford Wynne gave a detailed description of the gypsum deposits of the Dove Valley. The discussion on this paper was well sustained. Mr. Bennett H. Brough pointed out that the author in his introductory sketch of the occurrence of gypsum had omitted to refer to the Paris deposits, which produced two-thirds of the world's supply. The speaker suggested that there was considerable room for improvement in the manufacture of plaster of Paris. Scientific progress had hardly touched the technology of this material, and the temperature of burning and the degree of fineness received no attention. The methods of testing gypsum were now to be investigated by a committee of the International Testing Congress. The charge of want of progress was warmly combated by other speakers, who adduced evidence to show the high degree of scientific method followed in several plaster works in this country. In conclusion, a paper was read by Mr. E. B. Wain and Mr. J. T. Stobbs on the Cauldon Low and Manifold Valley, North Staffordshire, a district of considerable geological interest, in which a large quarry of Carboniferous limestone of very pure quality is worked, and where at one time the famous Ecton copper mine was of great importance.

THE liverworts of Japan have attracted the attention of bryologists on account of the special peculiarities of certain species referable to well-known genera. Mr. A. W. Evans describes and figures a few new or interesting species, mostly collected in the province of Tosa, in vol. viii. of the Proceedings of the Washington Academy of Sciences. A species of Harpalejeunia is interesting as forming a link between that genus and Drepanolejeunia.

TRACING the development of the State Forest Department in West Prussia, Dr. Koenig attributes the foundation of the present system to the personal interest and direction of Frederick the Great. With regard to the extent of forest, the writer is disposed to believe that more land might with advantage be afforested, notably the sandy and other unprofitable areas, provided the land were acquired by the State. The article appears in *Schriften der naturforschenden Gesellschaft* in Danzig, vol. ii., part iv.

IN the *Indian Forester* (July) the editorial article bears testimony to the foresight of the present Commander-in-Chief in India in demanding the preparation of working plans for cantonment forests in India, and summarises a similar scheme drafted by the United States Forest Service for the Military Department for a forest reservation at the military academy army post at West Point, New York. Following on previous references to types of forest rest-houses in India, Mr. E. P. Stebbing deals with those met with in Assam, that from descriptions and illustrations are no more satisfactory than those provided in Burma.

WITH reference to the maintenance of the Imperial Department of Agriculture in the West Indies, an editorial notice appears in *Tropical Life* on the work of botanical and experimental stations. It is appropriate to find in the same number a biography of Dr. J. C. Willis, who has done so much towards bringing the agricultural community in Ceylon into its present prosperous condition. A note on the camphor industry contains a description of the Formosan method of distillation, and the opinion is expressed that the present price of camphor could be reduced to one-third or less before the Formosan monopoly would be endangered.

THE *Museums Journal* for August is entirely occupied with the report of the recent conference at Bristol and an illustrated account and history of the museum buildings of that city. In the latter, the development of the museum and art-gallery is carefully recorded by Mr. W. R. Bacher during a period approaching a century and a half—1772–1906. It is well known that the Bristol Museum possesses a number of natural history treasures, among them an example of the typical southern race of the bonte-quagga, or Burchell's zebra, now apparently extinct, and unrepresented in the national collection.

IN the twenty-first Educational Leaflet, dealing with the scarlet tanager, the U.S. National Association of Audubon Societies (as represented by its president, Mr. W. Dutcher) strikes an important note in asserting that its objects are not limited to the protection of birds, but embrace the awakening of an interest on the part of the agriculturist (as well as the student) in bird-life generally. Undoubtedly this is the right way of looking at the subject, and if it were inculcated and adopted in this country (together with some relaxation of the law in regard to species held to be harmful by practical people), we should probably hear fewer objections to bird protection. The coloured plate shows the male and female tanagers in their respective liveries of black and scarlet and greenish-yellow, and also the cock bird in process of reverting for the winter to the comparatively dull plumage of his mate.

IN an article entitled "The Negro Brain," published in the September issue of the *Century Illustrated Monthly Magazine*, Dr. R. B. Bean rejects the doctrine that the negro is the brother of the white man. After demonstrating that the male Caucasian brain is not only larger than that of the negro, but also differs in shape and by the smaller proportionate amount of grey matter and of connecting fibres, the author sums up as follows:—"The white and the black races are antipodal in cardinal points. The one has a large frontal region of the brain, the other a larger region behind; the one is a great reasoner, the other preeminently emotional; the one domineering, but having great self-control, the other meek and submissive, but violent and lacking self-control when the passions are aroused; the one a very advanced race, the other a very backward one. The Caucasian and the negro are fundamentally opposite extremes in evolution." These premises being admitted, it is clear (despite the fact that a negro may occasionally display exceptional mental powers) that to attempt to educate the two races on the same lines is neither more nor less than folly. Incidentally, the author shows that the American negro, in place of being entirely of the Guinea type, includes representatives of the Bushman and of the Bantu (Kafir) types.

IN *Canary and Cage-bird Life* for August 31 Dr. A. R. Galloway records a case of cross-breeding in poultry which well exemplifies the Mendelian law. The two breeds crossed were the silkie bantam and the Pekin bantam, the former characterised by the pure white hair-like plumage, bluish-black skin, and small rose comb and crest, while the latter has the plumage cinnamon-buff, the skin pinkish, and the comb simple. Four years ago, when a silkie cock was mated with a Pekin hen, the hybrid chicks—between twenty and thirty in number—were all buff, although with a tendency to small dark markings. Nevertheless, the buff may be regarded as the dominant colour in the cross, but in the hens, at any rate, the black skin and small rose comb and crest of the silkie were apparent. During the present summer a first-cross buff cock paired with a buff hen of the same cross, and, of the eight chicks thus produced, one was a pure white silkie, two were pure buff Pekins, and five showed intermediate characters with regard to type, colour of skin, and colour and character of feather. This is a close approximation, considering the limited nature of the trial, to Mendel's law, which should give two pure silkies, four intermediates, and two buff Pekins. The five intermediates were as follows:—one a buff Pekin with blackish face and silkie-type of feather; one buff Pekin with blackish face and two or three quills white in each wing; one variegated buff Pekin showing about one-third of plumage white, with Pekin-type of face and silkie-feathers; two dark speckled grey, with blackish faces and a good deal of black markings on the feathers.

SOME curious results of the Californian earthquake are recorded by Prof. Campbell, director of the Lick Observatory, in No. 108 of the Publications of the Astronomical Society of the Pacific. Fortunately, as recorded in these columns on May 10, the observatory itself was not injured. Subsequent work has shown that the meridian circle and the polar axis of the 36-inch refractor show no sign of having shifted. The period of the earth vibrations was so long that the buildings and the instrument foundations had time to follow the movement without undue strain. There is some fear, however, that the financial affairs of the university and the observatory may be somewhat crippled by the huge losses incurred in property, &c. It is evident from the report that the neighbourhood suffered severely. The motion was chiefly of the horizontal shearing type, and we read of a public road which crossed the fault-line at right angles having its contiguous ends permanently displaced some 17 feet. A large tree standing on the edge of the fissure is 24 feet from the small roots it left behind it. A barn which stood exactly over the fissure, with some four-fifths of the structure on the west side, was badly wrecked, but the part of the foundations and superstructure situated on the west side remain, whilst the foundation lying east of the fissure has moved southward, under the barn, through 18 feet. Many similar instances of movement are recorded. About twenty miles westward of Mount Hamilton, on the fault-line, the maximum shift is about 8½ feet. As all the displacements referred to are in thick, loamy soil, which would tend to lag, it is probable that the shear in the underlying rock stratum is still greater. Some interesting questions as to farm boundaries, latitudes, and azimuths may be expected to arise. A commission, including Profs. Campbell and Leuschner, has been appointed by the Governor to study the scientific aspects of the phenomenon.

IN a letter from Glasgow, Mr. A. Mclance suggests that lead should be found in radio-active minerals containing radium. In a paper by Mr. Boltwood in the *Philosophical Magazine* for April, 1905 (p. 613), evidence is given of the existence of lead in all radio-active minerals. Mr. Mclance points out that if the atomic weight of radium is taken as 258, as found from spectroscopic observations by Runge and Precht, and the combined atomic weights of the five helium atoms into which the radium atom is believed to dissociate are subtracted from it, the atomic weight of uranium is obtained.

A SUMPTUOUS catalogue of telescopes and accessories has been published by the firm of Carl Zeiss, of Jena, under the specific designation "Astro: 8." Especially compiled for scientific amateur astronomers, the catalogue only deals with telescopes of less aperture than 8 inches. Several new constructions are now catalogued and illustrated for the first time. In addition to the numerous azimuthal and equatorial telescopes, the catalogue contains illustrations and prices of a large variety of eye-pieces, sun oculars, prominence and other spectroscopes, position micrometers, the stereo-comparator, &c., and should be consulted by all astronomers in need of telescopes or accessories.

IN No. 72 of the *Chemiker Zeitung* Dr. P. N. Raikow, of the University of Sophia, describes a simple method of boring any number of small holes through glass tubing, both thin and thick, watch glasses, flasks, &c. The part which it is desired to pierce is carefully warmed up in a Bunsen flame, and then a red-hot needle worked bradawl-wise against the particular spot, which naturally must not be so hot that any slight pressure causes the walls of the vessel or tube to be forced out of shape. The broken stem of a thermometer is said to provide an especially good handle for the eye end of the needle to be inserted into.

OUR ASTRONOMICAL COLUMN.

JUPITER'S SIXTH SATELLITE.—A telegram from Prof. Campbell, published in No. 4119 of the *Astronomische Nachrichten*, states that Jupiter's sixth satellite was re-observed by its discoverer, Prof. Perrine, on August 26·9656 (G.M.T.). Its position angle at that time was 209°·92, and its distance from Jupiter 1734″.